

STATE OF MINNESOTA  
OFFICE OF ADMINISTRATIVE HEARINGS  
FOR THE DEPARTMENT OF NATURAL RESOURCES

In the Matter of the Appeal by Vicki  
Peterson of Order and Amendment to  
Limited Permit 89-3593

**FINDINGS OF FACT,  
CONCLUSIONS AND  
RECOMMENDATION**

The matter was heard by Administrative Law Judge Richard C. Luis (ALJ) on July 16 and 17, in Grand Rapids, Minnesota, and on September 4, 2012 at the Office of Administrative Hearings in St. Paul, Minnesota.

Appearances:

David Iverson, Assistant Attorney General, for the Staff of the Minnesota Department of Natural Resources (DNR).

Dennis O'Toole, Esq., Lano, Nelson, O'Toole and Bengtson, for Vicki Peterson (Respondent).

Michael Orman, Esq., Orman Nord and Hurd, for Intervenors Langley, LeBlanc, Ophus, and Else.

Andrew Hultgren, Esq., Neils, Franz, Chirhart, Hultgren and Evenson, for Intervenors Ethan and Riggle.

The record closed with the receipt of briefs from all parties on October 1, 2012.

**STATEMENT OF ISSUE**

1. Whether the jetties at the entrance to the Respondent's marina are a material cause of erosion of the beaches on the properties of the Intervenors lying east of the jetties; and

2. If the jetties are a material cause of erosion, what remedial action is appropriate?

Based on the proceedings, the ALJ makes the following:

## FINDINGS OF FACT

1. Vicki Peterson is the current owner of North Star Resort, which is located at 584 North Star Drive Northeast, Federal Dam, Minnesota.<sup>1</sup> Ms. Peterson purchased North Star Resort with her late husband, Walter Peterson, in 1999.<sup>2</sup>

2. Ms. Peterson is also the sole owner of a construction company.<sup>3</sup> The company owns a number of excavators, 12 yard dump trucks, and bobcats.<sup>4</sup>

3. North Star Resort is on Portage Bay at the northwest end of Leech Lake. Leech Lake is a public water of the State of Minnesota under the public waters work permit jurisdiction of DNR.<sup>5</sup> It is located in Cass County in north central Minnesota.<sup>6</sup> Leech is a large lake (approximately 175 square miles) consisting of many large and small bays.<sup>7</sup> Much of its watershed contains well drained sandy or sandy loam soils that developed from sandy glacial till and outwash materials produced by glacial activity.<sup>8</sup>

4. Portage Bay, located at the northeastern end of Leech Lake, has both shallow and deep water zones, with maximum depths of about 24 feet.<sup>9</sup> The bay is generally shallow in the vicinity of the Resort and the Intervenor's properties, often being no deeper than three feet at a distance of 350 feet offshore.<sup>10</sup> The near shore areas of Portage Bay consist primarily of sand.<sup>11</sup>

5. The main basin of Portage Bay receives heavy wave action from southern winds.<sup>12</sup> The amount of submerged aquatic vegetation is sparse along the sandy bottom of Portage Bay offshore of North Star Resort and the Intervenor's properties. The sparse vegetation indicates that wave action is significant enough to disrupt its growth.<sup>13</sup>

6. Leech Lake is one of the reservoirs within the Mississippi Headwater Reservoir System managed by the U.S. Army Corps of Engineers (Corps).<sup>14</sup> A dam was constructed by the Corps in the 1880s at the outlet of Leech Lake.<sup>15</sup> The Corps regulates outflow from the Leech Lake dam in accordance with an established operation plan that has not been changed since 1944.<sup>16</sup>

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<sup>1</sup> Transcript ("Tr.") at 361-62.

<sup>2</sup> Tr. at 378.

<sup>3</sup> Tr. at 438.

<sup>4</sup> Tr. at 454, 457.

<sup>5</sup> Tr. at 361-62.

<sup>6</sup> Exhibit ("Ex.") 30 at 1.

<sup>7</sup> *Id.*

<sup>8</sup> *Id.* at 1-2, *see also* Tr. at 221-22.

<sup>9</sup> Ex. 30 at 2.

<sup>10</sup> Tr. at 222, 825-26; Ex. 5; Ex. 30 at 12.

<sup>11</sup> Ex. 30 at 6, 7.

<sup>12</sup> Ex. 30 at 10.

<sup>13</sup> Ex. 30 at 7.

<sup>14</sup> Ex. 30 at 4.

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

7. Recorded lake level data for Leech Lake indicate that the level fluctuates from about 1 to 1 1/2 feet during any given year.<sup>17</sup> Occasional higher levels will occur following heavy rainfall and/or snow melt, as will periodic lower levels during extended dry conditions.<sup>18</sup> No changes in the reservoir operation have been implemented since construction of the North Star Resort jetties early in 1990, and the lake levels have not reached extreme highs or lows since then.<sup>19</sup>

8. North Star Resort and the Intervenor's properties are located roughly in the middle of a 1.7 mile long beach shaped in a gentle crescent at the end of Portage Bay.<sup>20</sup> The beach runs on a line from northwest to southeast.

9. North Star Resort and the Intervenor's properties are at the end of the longest fetch of Leech Lake, roughly 15 miles.<sup>21</sup> A "fetch" is the distance over which wind blows; that is, the length of open water in the direction from which the wind is blowing.<sup>22</sup> The height of waves approaching the given shoreline is primarily based upon wind speed and fetch. Generally, the longer the fetch the higher the waves.<sup>23</sup>

10. "Longshore drift" is a common phenomenon whereby waves approaching a beach at an angle cause a net movement of sand parallel to the beach in a down drift direction.<sup>24</sup> The momentum of waves will push sediment up the beach at an angle, the water and sand will then move straight down the beach along a "fall line" in response to gravity.<sup>25</sup> This process repeats itself with each wave that washes onto the shore.<sup>26</sup>

11. Longshore drift of sand and sediments can occur in either direction at any point in time, depending upon the wind direction.<sup>27</sup> However, if there is a predominant wind direction, the sand and sediment will eventually move down the shoreline in that predominant direction.<sup>28</sup>

12. Many studies and research articles exist regarding the impact of structures, such as jetties, breakwaters, and groins, on longshore drift.<sup>29</sup> In general, such structures "will disrupt the usual processes in the zone of wave action."<sup>30</sup> As noted by DNR's Dr. Jeannette Leete and James Solstad, PE, in their Expert Report:

Jetties and breakwaters thus disrupt the movement of sand with longshore currents, preventing nearby unprotected sections of beaches from being replenished while the removal of sand through erosion continues. The

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<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*, see also Tr. at 231, 240, 249.

<sup>20</sup> Ex. 30 at 5.

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

<sup>24</sup> Tr. at 216-17; Ex. 30 at 9.

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> *Id.*

<sup>29</sup> Tr. at 225, 227-28; Ex. 30 at 16.

<sup>30</sup> Ex. 30 at 16; see also Tr. at 220, 962.

result will be the gradual loss of the beach on the (net) down drift side of the structure. For these reasons, acceptance of jetties and breakwaters as a typical shore protection strategy has been declining over the two decades since the permit in question was issued.<sup>31</sup>

13. Prior to Ms. Peterson's purchase in 1999, North Star Resort was owned by Thomas LeGro.<sup>32</sup> Prior to 1990, LeGro used a 260 foot dock to provide mooring for the boats of the Resort's clientele.<sup>33</sup>

14. On June 26, 1989, LeGro applied to DNR for a public waters work permit to "create harbor by excavating on shore and installing rock barriers out into the lake to provide channel access."<sup>34</sup> LeGro proposed that the rock barriers (jetties)<sup>35</sup> be 260 feet long.<sup>36</sup>

15. Mr. LeGro's proposal addresses the natural movement of sand along the shoreline. Specifically, in response to the section entitled "Environmental Impact" on the DNR application form, LeGro stated that the "water break will alter sand drift along shoreline; harbor will use some wetlands."

16. In his cover letter dated June 23, 1989, LeGro stated:

Our existing dock, which is 260 feet long, has not been a navigation hazard and serves to show people that this is a shallow area. The water depth is only 35 inches at the end of the dock. This is why we need the breakwater this distance to control the sand drifting into the navigation channel.

17. Mr. LeGro's permit application was processed by DNR Area Hydrologist Ron Morreim.<sup>37</sup> Morreim considered "longshore drift" and its interruption by the proposed jetties to be a potential concern. In a memorandum dated December 7, 1989, regarding his investigation, Morreim stated:

While it may be reasonable from the applicant's standpoint to extend breakwaters 260 feet lakeward, this represents an extensive encroachment into public water and would create a difficult "restoration" situation if modification is necessary in the future. It would be more advisable to limit the breakwater length to 125 feet which would extend through the shallowest area, and area of greatest longshore drift potential. If a reduced breakwater length does not create any problems with drift or

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<sup>31</sup> Ex. 30 at 16.

<sup>32</sup> Tr. at 370; Ex. 6 at 1.

<sup>33</sup> Tr. at 40; Ex. 30, App. F at 4, 6.

<sup>34</sup> Ex. 6 at 1; see also Tr. at 32.

<sup>35</sup> The terms "rock barriers," "jetties," and "breakwaters" were used interchangeably by witnesses and in various exhibits to refer to the rock structures located at North Star Resort. However, it is more appropriate to refer to the structures as jetties because the term breakwaters also refers to rock structures that do not connect with the shoreline. (Tr. at 30.) The rock structures located at North Star Resort connect to the shoreline, so they are more appropriately referred to as jetties. (*Id.*)

<sup>36</sup> Tr. at 34; Ex. 6 at 4.

<sup>37</sup> Tr. 30-31.

navigation, etc., it would be advisable to extend the length in the future for more protection of the access channel, this could be considered as a modification of the permit.

*It should be noted that longshore sand drift may be a problem in this area.* An old inland harbor located north of the resort office (now filled in) reportedly required at least annual maintenance excavation of the entrance channel. Therefore, provisions should be included in the permit to protect the department's interest relating to impact on adjacent shoreland areas, breakwater modification, etc.<sup>38</sup>

18. Morreim also noted that "[t]he harbor site is located in a Type II/VI wetland area."<sup>39</sup>

19. DNR issued LeGro Limited Deed Recorded Permit 89-3593 ("permit") by cover letter dated December 8, 1989.<sup>40</sup> This permit authorized the construction of an inland harbor and an excavated entrance channel 440 feet in length, 260 feet lakeward and 180 feet inland.<sup>41</sup> The permit also authorized the construction of two 125-foot rock jetties into the lake on each side of the channel.<sup>42</sup> The permit cover letter noted that "[t]he original proposal would result in extensive breakwater construction, which raises concerns regarding public safety, aesthetics, *and sediment drift concerns*."<sup>43</sup> The permit was recorded with the Cass County Recorder on December 15, 1989.<sup>44</sup>

20. The permit includes a number of general and special provisions applicable to the project:

- General Provision No. 4 states that "[t]his permit may be terminated by the Commissioner of Natural Resources at any time he deems it necessary for the conservation of the water resources of the state, and in the interest of the public health and welfare ...."<sup>45</sup>
- General Provision No. 7 states that "[i]n all cases where the doing by the permittee of anything authorized by this permit shall involve the taking, using, or damaging of any property rights or interest of any other person or persons, ... the permittee, before proceeding therewith, shall obtain the written consent of all persons, agencies, or authorities concerned, and shall acquire all property rights and interests necessary therefore."<sup>46</sup>
- General Provision No. 8 states "[t]his permit is permissive only."<sup>47</sup>

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<sup>38</sup> Ex. 7. Emphasis added.

<sup>39</sup> Ex. 7.

<sup>40</sup> Ex. 8.

<sup>41</sup> *Id.*

<sup>42</sup> *Id.*

<sup>43</sup> *Id.* at 1. Emphasis added.

<sup>44</sup> See Ex. 57.

<sup>45</sup> Ex. 8 at 3.

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

- General Provision No. 15 states in part that "[a]ny Commissioner's Order terminating this permit may also require the permittee, at his own expense, to remove within the time specified in said Order, any authorized project constructed under this permit ...."<sup>48</sup>

21. Special Provision No. 6 of the permit states:

The Department of Natural Resources reserves the right to require modification of the authorized breakwaters if necessary to protect the public's interest. Furthermore, the DNR assumes no liability regarding any impact to adjacent property resulting from the interruption of sand drifts by said breakwaters. Permittee may be directed by the Department to reasonably repair any such shoreline damage.<sup>49</sup>

22. Mr. LeGro constructed the inland harbor, channel and jetties in winter and spring of 1990.<sup>50</sup> The actual construction work was performed by Ms. Peterson's construction company, then operated by her late husband, Walter Peterson.<sup>51</sup>

23. The two rock jetties were constructed of large rocks and boulders.<sup>52</sup> Each jetty was constructed approximately 45 to 65 feet in width at its base. The jetties were constructed approximately 50 feet apart, measuring from the centerline of each jetty,<sup>53</sup> and extended 125 feet into the lake from the shoreline.<sup>54</sup>

24. Presently, the harbor has slips for 40 boats, although on July 16, 2012, the date of the ALJ's site visit, only 9 or 10 boats were moored in the harbor.<sup>55</sup>

25. The inland harbor was constructed in a wetland area located behind the beachfront property of the Resort.<sup>56</sup> Its entrance channel extends perpendicular to the shoreline approximately 180 feet landward; the main body of the harbor then extends parallel to the shoreline to the northwest approximately 300 feet.<sup>57</sup>

26. DNR's permit file contains photographs showing construction in the wetland area.<sup>58</sup> LeGro's permit application project drawing also depicts the harbor construction as taking place in a wetland.<sup>59</sup>

27. Mr. Morreim submitted a "Requisition for Hydrographic Services" dated March 19, 1990, to the DNR Division of Waters requesting that a land survey be undertaken by a DNR Survey Crew along the shoreline located on each side of the

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<sup>48</sup> *Id.* at 4.

<sup>49</sup> Ex. 8 at 5.

<sup>50</sup> Tr. at 53.

<sup>51</sup> Tr. at 110.

<sup>52</sup> Ex. 8 at 3.

<sup>53</sup> Tr. at 295; Ex. 25.

<sup>54</sup> Tr. at 46.

<sup>55</sup> Tr. at 421.

<sup>56</sup> Tr. at 938.

<sup>57</sup> Tr. at 938-40; Ex. 6 at 3.

<sup>58</sup> Tr. at 938-39; Ex. 30, App. F at 4, App. G at 3.

<sup>59</sup> Ex. 6 at 3.

jetties.<sup>60</sup> On the requisition form, Morreim noted that "[t]he breakwaters, which are located in an area of shallow water and sand bed material, have a potential for interrupting normal longshore drift patterns."<sup>61</sup> He requested that "[l]ake bed profiles extending perpendicular from shore on both sides of the breakwaters" be undertaken,<sup>62</sup> and that "[a] sufficient number of cross sections ... be surveyed to document bed conditions extending both direction from the breakwaters, particularly southeasterly adjacent to other private property."<sup>63</sup>

28. The survey was undertaken by the DNR Survey Crew on May 18, 1990.<sup>64</sup> The survey notes were reduced by DNR to two topographical drawings.<sup>65</sup>

29. One topographical drawing depicts the North Star Resort shoreline from an aerial view, with the cross section survey lines noted perpendicular to the shoreline both northwest and southeast of the jetties.<sup>66</sup> The water level was established as 1294.74 feet and is shown on the drawing as the "water's edge" by a contour line.<sup>67</sup> A baseline is located landward of the water's edge.<sup>68</sup>

30. The first drawing from the 1990 notes includes contour lines that reflect the change in the elevation of the lakebed as well as the contour of the shoreline.<sup>69</sup> The contour lines reflect that the shoreline northwest of the jetties had a fairly gentle slope; the shoreline southeast of the jetties appears slightly steeper immediately southeast of the jetties, becoming more gentle as it moves southeast from the jetties.<sup>70</sup>

31. The second topographical drawing from the 1990 notes depicts the cross section surveys that were undertaken on both sides of the jetties and reflects the lakebed and shoreline elevation at those locations.<sup>71</sup> Four cross sections were made northwest of the jetties; six cross sections were made southeast of the jetties.<sup>72</sup> The cross section drawings depict a generally gradual sloped shoreline on both sides of the jetties.<sup>73</sup>

32. The permit required advance DNR permission for any maintenance dredging of the entrance channel and/or inland harbor.<sup>74</sup> The first request for maintenance dredging was made in 2000, when Walter Peterson made a request by telephone, which was granted by then DNR Area Hydrologist Kirk English.<sup>75</sup>

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<sup>60</sup> Tr. at 61-62; Ex. 9.

<sup>61</sup> Ex. 9.

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

<sup>64</sup> Exs. 10, 29 at 5.

<sup>65</sup> Tr. at 167; Ex. 29 at 6.

<sup>66</sup> Tr. at 168, 173-74; Ex. 11.

<sup>67</sup> Tr. at 177; Ex. 11.

<sup>68</sup> Tr. at 193; Ex. 11.

<sup>69</sup> Tr. at 174 75; Ex. 11.

<sup>70</sup> Tr. at 178; Ex. 11.

<sup>71</sup> Tr. at 172-75; Ex. 12.

<sup>72</sup> Tr. at 773, Ex. 11.

<sup>73</sup> Tr. at 177-78; Ex. 12.

<sup>74</sup> Ex. 8 at 5, Special Provision No. 4.

<sup>75</sup> Tr. at 67, 71; Ex. 13.

33. Among other DNR requirements, excavated dredge material was required to be deposited on an upland site.<sup>76</sup> The upland site utilized by North Star Resort is located on the Resort property.<sup>77</sup>

34. Seven other requests for channel maintenance were authorized—2003 through 2008, and 2010.<sup>78</sup> Most of the dredging was performed in the winter through the ice, and was done near the mouth of the jetties.<sup>79</sup> The resort performed the authorized channel maintenance four or five times.<sup>80</sup>

35. The jetties lie at the eastern end of the North Star Resort property, with the eastern jetty located in the proximity of the resort's property line.<sup>81</sup>

36. A number of shoreline lots owned by the Intervenor are located immediately to the east of the eastern jetty. Many of the lots have improvements.

37. The lot owners, moving southeasterly from the eastern jetty, are:<sup>82</sup>

- The Yantes (not an intervening party) own a small corner lot immediately adjacent to the eastern jetty. A cabin is located on the lot;<sup>83</sup>
- Larry LeBlanc owns approximately 350 feet of shoreline adjacent to the Yantes, containing a cabin and auxiliary structures;<sup>84</sup>
- There is then a small 25 foot wide lot of undeveloped shoreline owned by Cheryl Riggle;<sup>85</sup>

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<sup>76</sup> Tr. at 68; Ex. 8 at 4, General Provision No. 9; Ex. 13.

<sup>77</sup> Tr. at 410-11, 425.

<sup>78</sup> Tr. at 68-70; Exs. 14-22.

<sup>79</sup> Tr. at 410.

<sup>80</sup> Tr. at 409.

<sup>81</sup> Tr. at 905; Ex. 6 at 3, 4.

<sup>82</sup> For a plat view of these properties, see Exs. 302 and 304 (Tr. at 901-09).

<sup>83</sup> Tr. at 850.

<sup>84</sup> Tr. at 850.

<sup>85</sup> Tr. at 902-03.



- Adjacent to this parcel is a 250 foot lot owned by the Else Family Trust.<sup>86</sup> An old cabin is constructed on this property very near the shoreline;<sup>87</sup>
- Next to the Else's property is a 100 foot lot owned by Robert Ethen. Mr. Ethen purchased this lot in 1983 and placed a camper on the property.<sup>88</sup> He later constructed a cabin on the lot;<sup>89</sup>
- Immediately southeast of the Ethen property is a 100 foot wide lot owned by Vern and Judith Ophus.<sup>90</sup> A cabin is located on this lot;<sup>91</sup>
- East of the Ophus property is a 100 foot wide lot purchased by Mr. Ethen in 2009.<sup>92</sup> A cabin is located on this lot;<sup>93</sup>
- Immediately east of the Ethen property is a 200 foot wide lot owned by Terry Langley.<sup>94</sup> A camper and three out buildings are located on this property;<sup>95</sup> and
- Immediately east from there is property owned by the Riggles.<sup>96</sup> This property has approximately 320 feet of shoreline.

38. Regarding the shoreline and property conditions of the Intervenors' parcels, prior to and immediately after the construction of the jetties by North Star Resort, the properties enjoyed sand beaches and shorelines vegetated with grasses and trees.<sup>97</sup> Numerous photographs of the various properties depict these sand beaches and the property owners and their guests enjoying recreational activities along the beachfronts.<sup>98</sup>

39. In the mid-2000s, the Intervenors began to experience a noticeable loss of their beach sand and the narrowing of their beaches.<sup>99</sup> This loss of sand continued on a yearly basis until their beaches were lost, and severe ice jacking with associated erosion of the upland areas of the lots began.<sup>100</sup>

40. In more recent years, the upland area erosion has caused the loss of a significant number of trees.<sup>101</sup>

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<sup>86</sup> Tr. at 912.

<sup>87</sup> Tr. at 914.

<sup>88</sup> Tr. at 810, 816.

<sup>89</sup> Tr. at 816.

<sup>90</sup> Tr. at 811, 868.

<sup>91</sup> Tr. at 868.

<sup>92</sup> Tr. at 810-11.

<sup>93</sup> Tr. at 815.

<sup>94</sup> Tr. at 884-86.

<sup>95</sup> Tr. at 885.

<sup>96</sup> Tr. at 902; Ex. 304.

<sup>97</sup> Tr. at 817, 853, 860, 878, 887-88, 914-916; Exs. 28 at photos 16-18, 22-23, 27-28, 31-32.

<sup>98</sup> See e.g., Exs. 219, 223-26, 234.

<sup>99</sup> See, e.g., Tr. at 829-30, 869, 914.

<sup>100</sup> See, e.g., Tr. at 830-34, 852-53, 859-61, 874-76, 914.

<sup>101</sup> See, e.g., Tr. at 830, 890, 855-56, 869, 878, 919, 922, 926; Exs. 32, 34-51.

41. The Intervenor is convinced that the jetties located on North Star Resort interfered with the predominant longshore drift to the southeast, depriving their shorelines of the necessary renourishment of sand, resulting ultimately in erosion to their shoreline due to wave action in the open water season and ice jacking in the winter.<sup>102</sup>

42. Ice jacking is a phenomenon experienced on lakes during and immediately after the winter freeze.<sup>103</sup> Cracks form in the winter ice due to contraction, then water rises up and freezes in the cracks, expanding the ice sheet slightly.<sup>104</sup> The pushing action of the icesheet against the shoreline can cause ridges of pushed soil to move upland as a result of alternate warming and cooling of the ice sheet.<sup>105</sup>

43. Ice jacking acts strongly against steeply sloping shorelines, less so against gently sloping beaches, due to the fact that the ice will tend to “slide” over the gently sloping beaches as opposed to pushing flush against a steep shoreline profile.<sup>106</sup> Ice jacking can be devastating to structures located near an eroding shoreline due to the force of the pushing ice.<sup>107</sup>

44. On February 1, 2011, the six Intervenor addressed a letter to the Commissioner of DNR.<sup>108</sup> The Intervenor drafted the letter with the aid of Allyz K. Polacsek, an employee of engineering firm SEH, Inc.<sup>109</sup> The Intervenor stated that the jetties located at North Star Resort had interfered with net longshore drift to the southeast, robbing their shorelines of sand and the protection provided by the beach from erosion.<sup>110</sup> The Intervenor’s letter included photographs of their shoreline to support their claims.<sup>111</sup>

45. The Intervenor requested that DNR take action to implement a review of the limited deed recorded permit issued to North Star Resort.<sup>112</sup>

46. DNR Area Hydrologist Daniel Thul followed up on the Intervenor’s letter.<sup>113</sup> His review of the DNR permit file for North Star Resort<sup>114</sup> showed that effects on longshore drift had been considered a possible problem for the site and that a survey had been undertaken in 1990 to establish a historic baseline.<sup>115</sup>

47. Mr. Thul prepared a “Requisition for Technical Services” dated March 17, 2011, requesting a DNR Survey Crew to recreate the survey undertaken in 1990 in

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<sup>102</sup> Tr. at 833, 839, 851.

<sup>103</sup> Tr. at 80; Ex. 30 at 15.

<sup>104</sup> *Id.*

<sup>105</sup> *Id.*

<sup>106</sup> Tr. at 282; Ex. 30 at 15.

<sup>107</sup> *Id.*

<sup>108</sup> Tr. at 71; Ex. 55.

<sup>109</sup> Tr. at 667, 671.

<sup>110</sup> Ex. 55 at 2-3.

<sup>111</sup> Ex. 55.

<sup>112</sup> *Id.* at 3.

<sup>113</sup> Tr. at 73.

<sup>114</sup> Tr. at 75.

<sup>115</sup> Tr. at 62, 95-96.

order to determine whether changes had occurred to the shoreline, both northwest and southeast of the existing jetties.<sup>116</sup> The survey was performed on May 17 and 18, 2011.<sup>117</sup>

48. The 2011 survey reestablished the baseline used in 1990 and recreated the cross sections by surveying lakeward of the baseline and approximately parallel to the jetties.<sup>118</sup> The water level at the time of the survey was identified as 1,294.63 feet, as compared to the water level of 1,294.74 feet at the time of the survey in 1990, a difference of just over one inch.<sup>119</sup>

49. DNR prepared two topographical drawings of the 2011 survey.<sup>120</sup> The aerial view drawing relocates the baseline from the 1990 survey and depicts the cross sections undertaken by the DNR Survey Crew—four to the northwest of the jetties and six to the southeast of the jetties.<sup>121</sup> This drawing also contains a blue line that signifies the water's edge at the time of the survey.<sup>122</sup> Like the 1990 drawing<sup>123</sup>, this drawing depicts contour lines of the lake bottom offshore of the upland area, as well as the upland adjacent to the shoreline.<sup>124</sup>

50. The shoreline to the southeast of the jetties appears to be steep, while the contour lines to the northwest of the jetties have a more gradual slope to the waterline.<sup>125</sup> The reestablished baseline, which in 1990 ran its entire length on the upland, is now located primarily in the lake to the southeast of the jetties, reflecting the loss of upland area.<sup>126</sup>

51. DNR also prepared a topographical drawing of the cross section survey performed in 2011.<sup>127</sup> This drawing includes both the cross sections as established at the time of the 2011 survey, denoted by a solid line, and the cross sections as established in 1990, denoted by a dashed line, to provide a comparison.<sup>128</sup>

52. A cross section comparison of the shoreline in 1990 and 2011 shows that a significant amount of upland and beach had been lost to the southeast of the jetties since 1990, and additional beach material had been accumulated on the west side of the jetties since construction.<sup>129</sup> The comparison indicates that the jetties had interrupted longshore drift to the southeast, leading to the damage experienced by the Intervenor.<sup>130</sup>

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<sup>116</sup> Tr. at 96, 179; Ex. 23.

<sup>117</sup> Tr. at 165, 182, 190; Ex. 24.

<sup>118</sup> Tr. at 179; Ex. 24.

<sup>119</sup> Tr. at 190.

<sup>120</sup> Tr. at 182; Exs. 25, 26.

<sup>121</sup> Tr. at 182-83; Ex. 25.

<sup>122</sup> Tr. at 186-87; Ex. 25.

<sup>123</sup> Ex. 11

<sup>124</sup> Ex. 25.

<sup>125</sup> Tr. at 193; Ex. 25.

<sup>126</sup> Tr. 186-88, 191, 193; Ex. 25.

<sup>127</sup> Tr. at 182; Ex. 26.

<sup>128</sup> Tr. at 185-86; Ex. 26.

<sup>129</sup> Tr. at 95, 98.

<sup>130</sup> Tr. at 98, 105-06.

53. Mr. Thul inspected the site with a number of the Intervenors on May 6, 2011.<sup>131</sup> He walked the shoreline and took a series of photographs of both the North Star Resort property and the Intervenors' properties.<sup>132</sup> The inspection revealed that North Star Resort's shoreline appeared to be intact and not subject to any erosion.<sup>133</sup> Southeast of the jetties, however, Mr. Thul observed what he described as severe erosion.<sup>134, 135</sup>

54. The property immediately to the east of the jetties, identified as the Yantes property, had extreme ice push, or ice jacking, and rock rip rap placed along the bank to protect the shoreline.<sup>136</sup> Moving to the southeast, Mr. Thul noted continued evidence of severe erosion, ice jacking, and loss of beachfront.<sup>137</sup> He observed that numerous mature trees had fallen into the lake due to the undercutting of their root systems.<sup>138</sup>

55. At the Else property, a cement sea wall had been undercut and had fallen over into the lake, and the patio brick that had been located behind this wall and in front of the cabin was broken up by the ice jacking and erosion.<sup>139</sup>

56. Further down the shoreline, Mr. Thul observed an outbuilding that appeared to be in danger of being damaged by ice jacking in the near future.<sup>140</sup> Additional loss of trees and evidence of ice jacking of the soils were seen as Mr. Thul progressed to the southeast.<sup>141</sup> Mr. Thul noted that as he progressed farther to the southeast, the erosion and damage lessened but was still visible.<sup>142</sup>

57. Mr. Thul received a letter/report dated July 5, 2011, from Short, Elliot, Hendrickson, Inc. (SEH) on behalf of a number of the Intervenors. In SEH's opinion, the jetties located at North Star Resort were interfering with the net longshore drift to the southeast.<sup>143</sup> The report included as supporting documentation a series of aerial photographs from 1939 through 2010, photographs from an air flight taken by Mr. Ethen, and historic photographs of a number of Intervenors' beaches before and after the ice jacking and erosion.<sup>144</sup>

58. Mr. Thul submitted the information that he had gathered to his superiors for a determination as to whether the jetties were a contributing factor to the erosion being experienced by the Intervenors at their properties.<sup>145</sup>

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<sup>131</sup> Tr. at 76-77.

<sup>132</sup> Tr. at 78; Exs. 31-54.

<sup>133</sup> Tr. at 78-79, 82.

<sup>134</sup> Mr. Thul walked on the upland in order to take photographs to the southeast of the jetties as there was no beach. (Tr. at 83.)

<sup>135</sup> Tr. at 77-78.

<sup>136</sup> Tr. at 79-80, 82; Exs. 32, 34, 35.

<sup>137</sup> Tr. at 8, 85-94.

<sup>138</sup> Tr. at 85-94; Exs. 38-42.

<sup>139</sup> Tr. at 89-90, 925; Ex. 45.

<sup>140</sup> Tr. at 91; Ex. 47.

<sup>141</sup> Tr. at 91-94; Exs. 47-49.

<sup>142</sup> Tr. at 93-94; Exs. 52-54.

<sup>143</sup> Tr. at 104; Ex. 28.

<sup>144</sup> Tr. at 743-46; Ex. 28.

<sup>145</sup> Tr. at 94-95, 105.

59. The SEH letter/report was reviewed by DNR's James Solstad, PE.<sup>146</sup> Mr. Solstad opined to his superiors that the photographs included with the report appeared to provide strong evidence that the jetties were having an impact.<sup>147</sup>

60. After review, Mr. Thul's superiors determined that the existing jetties were interfering with net longshore drift to the southeast, which was contributing to the erosion being experienced by the Intervenor.<sup>148</sup>

61. Mr. Thul then prepared a draft Commissioner's Order and Amendment to Limited Permit 89-3593 directed to Ms. Peterson.<sup>149</sup> The Commissioner's Order and Amendment to Limited Permit (Order) was signed by the DNR Regional Manager and served on Ms. Peterson by U.S. mail on September 12, 2011.<sup>150</sup>

62. The Order states that DNR had determined that the jetties and access channel have interrupted natural sand drift that has resulted in severe damage to adjoining property owners.<sup>151</sup> Consequently, DNR stated that it was rescinding authorization of the two jetties and the maintenance dredging of the access channel.<sup>152</sup> In addition, DNR ordered Ms. Peterson to "reasonably repair the damaged shoreline and the adjacent properties."<sup>153</sup>

63. DNR directed that Ms. Peterson submit a detailed plan for review by DNR prior to the commencement of removal of the jetties and repair of the adjacent shorelines.<sup>154</sup> DNR also directed that any future maintenance dredging on the access channel within the lake would require a new permit application that would "undergo a complete and thorough review."<sup>155</sup>

64. By letter dated October 7, 2011, Mr. Peterson filed a timely appeal of the Commissioner's Order and Amendment to Limited Permit.<sup>156</sup>

65. As a result of the appeal, DNR directed Mr. Solstad and Dr. Jeanette Leete to undertake a study of the erosion occurring at the Intervenor's property and render an opinion, if any, regarding the cause or causes of that erosion.<sup>157</sup>

66. In their subsequent Report entitled "Leech Lake-Review of Shoreline Changes Since Construction of Jetties and Channel Maintenance at the North Star Resort," dated May 31, 2012, Solstad and Leete state "[t]he main focus of this evaluation is to develop an understanding of shoreline processes and of the possible

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<sup>146</sup> Tr. at 215.

<sup>147</sup> Tr. at 215.

<sup>148</sup> Tr. at 105-06.

<sup>149</sup> Tr. at 107-08.

<sup>150</sup> Tr. at 108; Ex. 1.

<sup>151</sup> Ex. 1.

<sup>152</sup> *Id.*

<sup>153</sup> *Id.* at 2.

<sup>154</sup> *Id.*

<sup>155</sup> *Id.*

<sup>156</sup> Ex. 2.

<sup>157</sup> Tr. at 212; Ex. 30 at 1.

role the jetties at North Star Resort have had in acceleration of erosion of the adjacent shoreline.”<sup>158</sup>

67. Solstad and Leete performed a literature search, reviewed aerial photographs, soil maps, geology, and other information gathered regarding the site specifically, and the Leech Lake area generally.<sup>159</sup>

68. In addition, Solstad and Leete took part in a site visit on April 5, 2012.<sup>160</sup> The site was inspected from the water by boat. They also viewed the shoreline of North Star Resort and the Intervenor’s properties.<sup>161</sup>

69. Solstad and Leete also inspected the shoreline west of North Star Resort, including the property of the owners directly to the northwest of the Resort (the Gustafsons), and the undeveloped shoreline further to the northwest.<sup>162</sup>

70. They also inspected the shoreline east of the Intervenor’s properties, which is undeveloped,<sup>163</sup> and inspected a “spit” of land located along the west shore of Portage Bay.<sup>164</sup>

71. Solstad and Leete incorporated their conclusions in a Report.<sup>165</sup> To summarize the findings, they determined that the prevailing winds and length of lake fetch lends itself to a net drift of sand from northwest to southeast along the Portage Bay shoreline, which includes the North Star Resort and the Intervenor’s properties.<sup>166</sup> They concluded that the fetch from the east and southeast was of insufficient length to provide a net movement of sand to the northwest.<sup>167</sup>

72. Solstad and Leete report that the shoreline to the northwest of the jetties is comprised of stable beach sand with little evidence of erosion.<sup>168</sup> Immediately to the east of the jetties they witnessed severe erosion occurring along the shoreline and along the Intervenor’s properties.<sup>169</sup> They found that the undeveloped shoreline to the northwest and southeast had not experienced such erosion.<sup>170</sup>

73. A review of aerial photographs for five decades prior to the jetties’ construction revealed a shoreline on both sides of the jetties in “a state of dynamic equilibrium.”<sup>171</sup>

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<sup>158</sup> Ex. 30 at 1.

<sup>159</sup> *Id.*

<sup>160</sup> Tr. at 219; see Ex. 30 at App. C.

<sup>161</sup> Tr. at 219.

<sup>162</sup> Tr. at 225, 402-03.

<sup>163</sup> Tr. at 225.

<sup>164</sup> Tr. at 219-20.

<sup>165</sup> Ex. 30.

<sup>166</sup> Tr. at 227-28, 280; Ex. 30 at 28.

<sup>167</sup> *Id.*

<sup>168</sup> Tr. at 228; Ex. 30 at 26-28, App. C at Reach 3.

<sup>169</sup> Tr. at 225.

<sup>170</sup> Tr. at 225, 231; Ex. 30 at 26.

<sup>171</sup> Ex. 30 at 17.

74. Based on literature on the impacts of structures placed in waters on longshore drift, Solstad and Leete concluded that the jetties were interrupting net longshore drift to the east, in effect starving the Intervenor's properties of sand replenishment.<sup>172</sup>

75. In Solstad's opinion, the lack of replenishment of sand along the Intervenor's shoreline reached a "critical point" where the shoreline could no longer fend off severe erosion resulting from wave action and ice jacking.<sup>173</sup> Once a sufficiently vertical face was created along the Intervenor's shoreline, it became more susceptible to ice jacking.<sup>174</sup> Without the gradually-sloped beach in front of the upland areas along the Intervenor's properties, the ice jacking accelerated the erosion by pressing against the steep slope of the remaining upland.<sup>175</sup>

76. Dredging of the channel into the inland harbor would interrupt sand moved by longshore drift until such time as it fills in.<sup>176</sup> The fact that clean-out was necessary serves as evidence that sand is moving along the shoreline.<sup>177</sup> Solstad suggested that, even with removal of the jetties, a dredged channel would continue to interrupt sand moved by longshore drift and, therefore, removal of the jetties alone would most likely not address the problem in its entirety.<sup>178</sup> He believes that if the jetties were removed and the dredging ceased, the natural equilibrium of the shoreline would be reestablished and the severe erosion seen now would be less likely to occur on a sustained basis.<sup>179</sup>

Based on the Findings of Fact, the Administrative Law Judge makes the following:

## **CONCLUSIONS**

1. The Administrative Law Judge and the Commissioner of Natural Resources have jurisdiction in this matter pursuant to Minn. Stat. §§ 14.50, Minn. Stat. ch. 103G and Minn. R. 6115.

2. The Notice of Hearing was proper and the DNR has fulfilled all procedural requirements.

3. Pursuant to Minn. Stat. § 103G.245, subd. 1(2) (2010), a person must have a DNR public waters work permit to "change or diminish the course, current, or cross-section of public waters, entirely or partially within the state, by any means, including filling, excavating, or placing of materials in or on the beds of public waters."

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<sup>172</sup> Tr. at 228; Ex. 30 at 28.

<sup>173</sup> Tr. at 269, 282-83.

<sup>174</sup> Tr. at 226.

<sup>175</sup> Tr. at 226; Ex. 30 at 28.

<sup>176</sup> Tr. at 274-75.

<sup>177</sup> Tr. at 537.

<sup>178</sup> Tr. at 274-75.

<sup>179</sup> Tr. at 229, 277.

4. A public waters work permit may be issued only if the project will involve a minimum encroachment, change, or damage to the environment, particularly the ecology of the waterway.<sup>180</sup>

5. Minn. Stat. § 103G.315, subd. 6(b) (2010) states that:

[i]n granting a permit, the commissioner may include in it terms and reservations about the amount and manner of the use or appropriation or method of construction or operation of controls as appear reasonably necessary for the safety and welfare of the people of the state.

6. Minn. Stat. § 103G.315, subd. 11(a) (2010) states that,

[e]xcept as otherwise expressly provided by law, a permit issued by the commissioner under this chapter is subject to:

- (1) cancellation by the commissioner at any time if necessary to protect the public interests; and
- (2) further conditions on the term of the permit or its cancellation as the commissioner may prescribe....

7. The details of DNR's public waters work permit program are governed by Minn. R. ch. 6115 (2011). Minn. R. 6115.0170, subpart 4 (2011) defines a "breakwater" as "an offshore structure intended to protect a shore area, harbor, or marina from wave and current action, erosion, or sedimentation." Minn. R. 6115.0211, subp. 4 (2011), states that "[a] permit is required for the construction or reconstruction of all offshore breakwaters." Subpart 8 then states that, "[w]here the commissioner has determined that a structure is no longer functional, constitutes a public nuisance or a hazard to navigation, or poses a threat to public health or safety, the structure shall be removed from public waters under the applicable provisions of these rules."

8. Minn. R. 6115.0200 (2011) governs the issuance of public waters work permits for excavation in public waters. That rule states that one of the goals of DNR is to limit the excavation of materials from the beds of public waters in order to "control the deposition of materials excavated from public waters and protect and preserve the waters and adjacent lands from sedimentation and other adverse physical and biological effects."<sup>181</sup> An additional goal is to "preserve the natural character of public waters and their shorelands, in order to minimize encroachment, change, or damage to the environment, particularly the ecosystem of the waters."<sup>182</sup>

9. Subpart 3.A of Minn. R. 6115.0200 states that excavation in public waters is prohibited "where it is intended to gain access to navigable water depths when such access can be reasonably attained by alternative means which would result in less environmental impact." In addition, excavation in public waters will be prohibited "where the excavation would not provide an effective solution to a problem because of recurrent

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<sup>180</sup> Minn. Stat. § 103G.245, subd. 7(a) (2010).

<sup>181</sup> Minn. R. 6115.0200, subp. 1.C (2011).

<sup>182</sup> Minn. R. 6115.0200, subp. 1.A (2011).



sedimentation and there are feasible and practical alternative solutions which do not require excavation.”<sup>183</sup>

10. DNR has established by a preponderance of the evidence that the jetties at the North Star Resort are a material cause of the erosion of the Intervenor’s shoreline.

11. It is appropriate to require removal of the jetties at North Star Resort, to order cessation of the channel dredging activity, and to order remedial measures to address the damage to the Intervenor’s shorelines.

12. It is appropriate to give priority to remedial action at the Else property.

13. It is appropriate to affirm the Commissioner’s Order and Amendment to Limited Permit 89-3593.

Based on the Conclusions, the Administrative Law Judge makes the following:

### **RECOMMENDATION**

**IT IS RECOMMENDED** that the Commissioner’s Order and Amendment to Limited Permit 89-3593 be **AFFIRMED**.

Dated: October 30, 2012

s/Richard C. Luis

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RICHARD C. LUIS

Administrative Law Judge

Doc ID 2474

Reported:

Kirby Kennedy and Associates

Barbara Carey and Gail Hinrichs, Court Reporters

Transcript Prepared

### **NOTICE**

This report is a recommendation, not a final decision. The Commissioner of Natural Resources (the Commissioner) will make the final decision after a review of the record. Under Minn. Stat. § 14.61, the Commissioner shall not make a final decision until this Report has been made available to the parties for at least ten calendar days. The parties may file exceptions to this Report and the Commissioner must consider the exceptions in making a final decision. Parties should contact Tom Landwehr Commissioner of Natural Resources, 443 Lafayette Road, St. Paul MN 55155, (651) 259-5022 to learn the procedure for filing exceptions or presenting argument.

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<sup>183</sup> Minn. R. 6115.0200, subps. 3.A and F (2011).

The record closes upon the filing of exceptions to the Report and the presentation of argument to the Commissioner, or upon the expiration of the deadline for doing so. The Commissioner must notify the parties and Administrative Law Judge of the date the record closes. If the Commissioner fails to issue a final decision within 90 days of the close of the record, this Report will constitute the final agency decision under Minn. Stat. § 14.62, subd. 2a.

Under Minn. Stat. § 14.62, subd. 1, the Commissioner is required to serve the final decision upon each party and the Administrative Law Judge by first class mail or as otherwise provided by law.

## MEMORANDUM

The exhibits and testimony introduced at the hearing support DNR's conclusion that the jetties and the continued dredging of the entrance channel contribute materially to the erosion occurring on the properties of the Intervenor.

The evidence supporting that position is substantial. DNR determined that the water levels of Leech Lake before and since the construction of the jetties has been essentially stable, with neither extreme highs or extreme lows, eliminating that factor as an explanation for the erosion experienced by the Intervenor.<sup>184</sup> DNR determined that the sand spit located on the western shore of Portage Bay indicates a movement of the sand from the southwest that acts as a source to replenish the movement of sand along the shoreline from the northwest to the southeast, concluding that "[t]hese landforms indicate that a long-term (over decades) balance between sand deposition and removal exists along the northwest shoreline of Portage Bay."<sup>185</sup>

DNR's analysis of the fetch lengths and predominant wind directions also supports the conclusion that the fetch is long enough from the west and west-southwest to potentially cause a net longshore drift to the southeast.<sup>186</sup> DNR noted that the fetch from the south-southeast and from the southeast "may not be long enough to cause longshore drift in the northwest direction, especially longshore drift directed at the portion of the beach southeast of the North Star Resort harbor."<sup>187</sup> Ms. Peterson's evidence is insufficient to counter these conclusions.<sup>188</sup>

DNR's comparison of the 1990 survey to the 2011 survey also supports the conclusion that the changes occurring on the shoreline on either side of the jetties are evidence of net longshore drift to the southeast. Additional sand has accumulated to the northwest side of the jetties, while southeast of the jetties significant soil material has been lost.<sup>189</sup>

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<sup>184</sup> Tr. at 240, 249, 231; see Ex. 30 at 4.

<sup>185</sup> Ex. 30 at 6.

<sup>186</sup> Ex. 30 at 10; see *also* Tr. at 758.

<sup>187</sup> Ex. 30 at 10.

<sup>188</sup> Ms. Peterson's expert, Mr. Wagner, did opine that the predominant wind direction would be in a northwesterly-westerly direction at the resort. (Tr. at 500.) This would imply that the net longshore drift transport of sand would be to the northwest along the shoreline. In such a scenario, one would expect to find an accumulation of sand on the east side of the east jetty. However, here we find the exact opposite.

<sup>189</sup> Tr. at 99-103, 113-116; Ex. 26.

Ms. Peterson noted that maintenance of the beach areas by her and lack of such activity by the Intervenor helps explain the difference but, some of the Intervenor testified that they too made attempts to maintain their shorelines.<sup>190</sup> Additional evidence that beach maintenance has little if anything to do with the changes in the shoreline is that the undeveloped shoreline to the far northwest and the far southeast of the jetties do not appear to be experiencing erosion. There was no evidence that those shorelines have been maintained in any fashion.<sup>191</sup> Consequently, the evidence reflects that any maintenance performed, or not performed, has little to do with the erosion experienced at the Intervenor's properties.

Historic photographs and aerial photographs also support DNR's conclusion. Specifically, prior to the jetties' construction and dredging activities, the Intervenor's property appeared to consist of a stable beachfront of gently sloping sand from the upland areas into the lake.<sup>192</sup> Prior to the construction of the jetties, the aerial photography also indicates that the shoreline was generally stable, with what appears to be a beach line visible on most of the pre-1990 photographs.<sup>193</sup> However, aerial photographs from 2008 and 2011 reveal the loss of a sand beach to the southeast of the jetties.<sup>194</sup>

The field observations are consistent with the phenomenon of longshore drift and the impact of physical structures such as jetties on the natural movement of shoreline material. As noted by DNR, a phenomenon supporting its opinion is the difference in shoreline within a matter of 100 feet, separated only by the width of the channel between the two jetties.<sup>195</sup> The only place where a highly altered shoreline is observed along the 1.7 mile length of north Portage Bay is immediately to the southeast of the jetty.<sup>196</sup> The logical conclusion is that the jetties have been a factor exacerbating the erosion experienced at the Intervenor's property by blocking longshore drift.

The buildup of sand on the updrift side of the jetties and necessary removal of sand from the channel results in the loss of sand available to replenish the shoreline on the downdrift side of the jetties. This loss of sand has contributed to the shoreland alteration caused by waves and ice jacking immediately to the southeast of the jetties.<sup>197</sup>

In a contested case proceeding, "[t]he party proposing that a certain action be taken must prove the facts at issue by a preponderance of the evidence ...."<sup>198</sup> The preponderance of the evidence supports DNR's decision here to amend the Resort's permit and require restoration.

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<sup>190</sup> See, e.g., Tr. at 824.

<sup>191</sup> Tr. at 231.

<sup>192</sup> See, e.g., Tr. at 817-20; Ex. 28 at photos 16-18, 22, 23, 27, 28, 31, 32, 36; Exs. 219, 223-226, 234.

<sup>193</sup> Tr. at 745-51; Ex. 28.

<sup>194</sup> Tr. at 751-53; Exs. 28, 30 at 23-24.

<sup>195</sup> Ex. 30 at 28.

<sup>196</sup> Ex. 30 at 26, 28, App. C.

<sup>197</sup> Ex. 30 at 28.

<sup>198</sup> Minn. R. 1400.7300, subp. 5 (2011).

Evidence introduced by Ms. Peterson that the jetties have not been a cause or contributing factor to the loss of shoreline of the Intervenor is less persuasive. Ms. Peterson's expert witness, Mr. Wagner, testified that he did not have an opinion as to whether longshore drift was to the southwest or southeast, and admitted that longshore drift could "play a part" in the erosion experienced by the Intervenor.<sup>199</sup>

Mr. Wagner's reliance on the alleged difference in soil characteristics as a leading cause of the erosion is not persuasive. Mr. Wagner did not perform any soil borings at the site to determine the soil characteristics at the Intervenor's properties, or compare it to the soil characteristics of the Resort.<sup>200</sup> Mr. Wagner did not walk along all of the Intervenor's property or boat offshore to inspect Intervenor's properties from the water.<sup>201</sup> His opinion was based substantially on the Natural Resources Conservation Service Web Soil Survey.<sup>202</sup>

The record shows that the soil change noted on the Web Soil Survey appears to be located two or three properties to the southeast of the jetties, not at the jetties, which calls into question any opinion that soil characteristics are the reason for the erosion occurring immediately to the southeast of the jetties.<sup>203</sup> The Web Soil Survey is a general representation of soil characteristics in an area that can only be verified with actual soil borings at the site of interest.<sup>204</sup> Also, the evidence shows that the shoreline of the Intervenor's properties appears to be comprised primarily of sand.<sup>205</sup> Absent results of actual soil borings, Mr. Wagner's comments regarding the difference in soil characteristics on the eroded property from that found on North Star Resort's beach have been discounted.<sup>206</sup>

Mr. Wagner also stated that the existence of wetland behind the Intervenor's properties was an indicator that the soils on the Intervenor's shoreline differed from that found at the Resort.<sup>207</sup> However, the undisputed testimony and evidence reveal that the inland harbor, which extends northwest from the access channel parallel to and behind the main beach of North Star Resort, was constructed within a wetland.<sup>208</sup> If Mr. Wagner's assumption was correct, the same soil should exist on the North Star Resort beach directly to the northwest of the jetties, and the soil in both places should experience the same erosion. However, the Resort's beach is not eroded. Indeed, it has increased in size.<sup>209</sup>

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<sup>199</sup> Tr. at 544-45, 596.

<sup>200</sup> Tr. at 522-23, 588.

<sup>201</sup> Tr. at 588-89, 610-12.

<sup>202</sup> DNR's Ex. 30, Appendix A at page 10.

<sup>203</sup> Tr. at 523-24, 942-43.

<sup>204</sup> Tr. at 688.

<sup>205</sup> Tr. at 715-717; Ex. 30, App. H at photos 1-12.

<sup>206</sup> It is interesting to note that Mr. Wagner's expert report makes no mention of his analysis of soil characteristics as a reason for the difference in the shorelines. (Ex. 128.)

<sup>207</sup> Tr. at 495-96.

<sup>208</sup> Tr. at 610-11, 936-40; Ex. 6 at 1; Ex. 7; Ex. 30, App. F at 4, App. G at 8 and 9.

<sup>209</sup> Ex. 26.

Mr. Wagner also did not inspect the undeveloped shoreline of Portage Bay either to the far southeast or to the far northwest,<sup>210</sup> which areas are marked by stable, relatively undisturbed sand beaches.<sup>211</sup>

Mr. Wagner suggested that the erosion problem experienced by the Intervenor could be the result of lake level fluctuations over the past two decades.<sup>212</sup> This suggestion, however, is not supported by the facts. As DNR noted at hearing, the Corps has managed the water level of Leech Lake pursuant to a management plan that has remained unchanged since 1944.<sup>213</sup> And the recorded lake level data reveals that the typical water level fluctuation is 1 to 1 1/2 feet during any given year.<sup>214</sup> Also, the lake levels during the 1990 DNR survey and the 2011 DNR survey were just over an inch apart.<sup>215</sup> And no extreme highs or extreme lows were recorded since construction of the jetties in 1990.<sup>216</sup>

Minnesota Statutes section 103G.315, subd. 3 (2012) authorizes DNR to issue a public waters work permit if the proposal is “reasonable, practical, and will adequately protect public safety and promote public welfare ....” DNR is required to reject a permit request or require modification of a project plan if DNR determines it is necessary “to protect the public interest.”<sup>217</sup> And a public waters work permit issued by DNR may be cancelled at any time “if necessary to protect the public interests.”<sup>218</sup>

Under this statutory framework, DNR acted within its legal authority to modify Ms. Peterson’s permit to require removal of the jetties and discontinuation of the maintenance dredging once it determined that the authorized jetties and dredging were not in the public interest. In this particular case, longshore drift and its possible detrimental impacts were a concern from the time the permit was originally issued in 1989, and terms were contained within the permit to address the issue if it arose.<sup>219, 220</sup>

Excavations for the development of inland harbors such as located at North Star Resort must be determined to be reasonable and practical and, among other items, must satisfactorily address “interference with stream flow or longshore drift.”<sup>221</sup> A public waters work permit may only be issued where it “avoids direct or indirect impacts to public water that may destroy or diminish the public water” and that “minimizes the impact to the public waters by limiting the degree or magnitude of the public water activity and its implementation.”<sup>222</sup>

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<sup>210</sup> Tr. at 588-89; 610-12.

<sup>211</sup> Tr. at 225, 231; Ex. 30, App. C at photos 1, 2, 3, 15, 16.

<sup>212</sup> Tr. at 545-49; Ex. 128 at 2.

<sup>213</sup> Tr. at 231, 240, 249; Ex. 30 at 4.

<sup>214</sup> *Id.*

<sup>215</sup> Ex. 26.

<sup>216</sup> Tr. at 231, 240, 249, 549-550; Ex. 30 at 4.

<sup>217</sup> Minn. Stat. § 103G.315, subd. 5 (2010).

<sup>218</sup> Minn. Stat. § 103G.315, subd. 11(a)(1) (2010).

<sup>219</sup> As this permit is of record in the county property records, Ms. Peterson was on notice that DNR had specifically reserved the right to modify the permit if necessary. (Ex. 57.)

<sup>220</sup> Ex. 8.

<sup>221</sup> Minn. R. 6115.0201, subp. 5E(2)(c) (2011).

<sup>222</sup> Minn. R. 6115.0240, subp. 3.C(5)(a) and (b) (2011).

It is clear from the record that the existence of the jetties and the maintenance dredging has interfered with net longshore drift to the southeast, detrimentally impacting the Intervenor's properties. Therefore, the existing permit does not minimize the impact to public waters. In fact, continued authorization of the jetties and associated channel maintenance will continue to "destroy or diminish the public water," contrary to the requirements of Minnesota Rule.

Minnesota Rule 6115.0200, subpart 3 (2011) prohibits excavation "to gain access to navigable water depths when such access can be reasonably attained by alternative means which would result in less environmental impact." Ms. Peterson has reasonable alternative means available to her here—she may utilize a dock and boat lifts as an alternative to the inland harbor.<sup>223</sup> As noted at hearing, a dock (260 feet in length) had been used for the mooring of watercraft at the Resort up until the construction of the inland harbor in 1990.<sup>224</sup> Such a dock would provide a reasonable, less damaging alternative to the inland harbor, jetties and dredged channel currently in use.

DNR argues that its requirement that Ms. Peterson restore the Intervenor's properties, at her expense, to the condition existing prior to the construction of the jetties is reasonable and based on statutory authority. In support of that argument, DNR notes that Minn. Stat. § 103G.315, subd. 7 (2010) authorizes DNR to "include in an order issuing or denying a permit a requirement for the applicant to take an action necessary to restore the public waters or their beds to the condition existing before unlawful activities, if any, were undertaken by the applicant." It maintains such a possibility was specifically noted in the limited deed recorded permit at General Provision No. 15,<sup>225</sup> which holds the Resort responsible for "unauthorized" activities.

The ALJ disagrees with the argument in the preceding paragraph because the evidence does not establish "unlawful" or "unauthorized" activity on the part of Ms. Peterson or previously owners of the Resort.

However, as emphasized by counsel for Intervenor Langley, et al., Ms. Peterson remains bound by the terms of the permit. Under Special Provision 6, the Department is allowed to direct her to reasonably repair any shoreline damage resulting from "interruption of sand drifts by said breakwaters [jetties]."<sup>226</sup>

It is undeniable that the bulk of the restoration involves restoring lost material to the Intervenor's shorelines. As noted at hearing, viable options include trucking sand in and/or utilizing material from the dredged spoil site on the North Star property.<sup>227</sup> Another possible option is moving sand from off shore onto the eroded beaches of the Intervenor property owners.<sup>228</sup>

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<sup>223</sup> Tr. at 111-12.

<sup>224</sup> Tr. 426, 826-28; Ex. 5.

<sup>225</sup> Ex. 8 at 4.

<sup>226</sup> Ex. 57.

<sup>227</sup> Tr. at 99-104.

<sup>228</sup> Tr. at 526-27, 605-06.

And, Ms. Peterson has construction equipment available to her to utilize for a restoration.<sup>229, 230</sup>

The greater weight of the evidence supports a conclusion that the jetties and ongoing maintenance dredging have interfered with the replenishment of the beaches along Intervenor's properties due to interference with net longshore drift. That lack of sand replenishment has slowly resulted in the loss of the protective beach in front of those properties, leading ultimately to severe erosion, tree loss due to wave action and ice jacking.

While loss of the jetties and the dredged channel would require the Resort to once again utilize a dock for boat mooring, it would be inappropriate for DNR to authorize activities that have had and will continue to have such a significant impact on the public water in general and the neighboring private properties in particular. Consequently, it is reasonable to require that the jetties be removed, the channel dredging be ceased, and the damage that has occurred to the neighboring properties be remedied.

For these reasons, the ALJ recommends affirmation of the Commissioner's Order and Amendment to Limited Permit 89-3593.

The Respondent argues that Mr. Solstad and Dr. Leete do not specialize in coastal engineering or in the improvement of sand and sediments in lakes, so their evidence should be discounted.

The ALJ concludes that Solstad and Leete both are credible. He is persuaded that, over time, the processes of long-shore drift (depositing lake bottom sand from west to east along the shore) on Portage Bay's shore outweigh the effects of cross-shore drift that tends to deposit sand in the opposite direction.

Ms. Peterson urges a discounting of the testimony of Intervenor's witness Mr. Angelo, noting that he allegedly believes more detailed studies are needed to compare the various causes of erosion, such as waves and ice.

The ALJ does not believe that Mr. Angelo's acknowledgement that more study will help acts to weaken his point that the jetties at North Star Resort have blocked long-shore drift of sand onto the Intervenor's shores. The cumulative result of that blockage made the shorelines to the east steeper, and less resistant to straight line forces like the recent big storms and ice formations.

Ms. Peterson's argument and that of her expert, Peter Wagner, that cross-shore drift and unusually severe weather in recent years account for the disappearance of the Intervenor's shorelines is not supported by the record.

Ms. Peterson's argument that she has done nothing unlawful and that it is inappropriate to require her to comply with DNR's Order, is misplaced. It is clear from the terms of the original permit that the Department can modify its terms.

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<sup>229</sup> In fact, Walter Peterson did just this for the Ethen property a decade ago. (Tr. at 842-43.)

<sup>230</sup> Tr. at 109, 454, 457.

Ms. Peterson's argument that because she is a member of the Minnesota Ojibwa Tribe, DNR has no enforcement authority against her (she maintains that authority is pre-empted by federal law) is inapplicable in this case, given that the signed permit acknowledging DNR's authority to modify is enforceable against her as a successor-in-interest to Thomas LeGro.

Ms. Peterson's pre-emption argument relies on *Bryan v. Itasca County*, 426 U.S. 373 (1976), which interprets 28 U.S.C. § 1360(b) as barring the State from encumbering an Indian's use of her real property, including water rights.

That argument does not apply here, where a government agency has a pre-existing right to require a property owner to order removal of a structure appurtenant to her property, and to order restoration if such action is in the public interest. This matter fits more appropriately under § 1360(a) of the statute, which allowed Minnesota to retain jurisdiction over civil actions to which Indians are parties, even if the cause of action arises on a reservation.

As recommended by the Intervenor and Dr. Leete, it is appropriate to dredge sand from the offshore lake bottom, and deposit that sand on the Intervenor's shorelines, as a long-term method of restoration. Ms. Peterson is responsible for the costs of that restoration.

More immediate priority should be given to deposit of protective sand, rocks or other material to try to prevent erosion in front of the Else family's cabin.

**R. C. L.**